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ABSTRACT

The Irving, Texas, Independent School District developed and implemented Project Eureka, a 1 year program, with Elementary Secondary Education Act Title IV, Part C monies, for grade 5 middle school gifted students. Of the 1,750 students tested on the School and College Aptitude Test and the Scientific Research Associates Achievement Test, and examined by means of student work samples, teacher recommendations, student nominations, and parent requests, the highest ranked 65 students were selected. Using Bloom's Taxonomy, the project focused on five areas of skill development: gathering data, organizing data, interpreting data, synthesizing data, and forecasting results. Resource persons included a journalist, marketing analyst, and history teacher. Results of pretest-posttest measures indicated highly significant gains by the students. Another result of the project was formation of the Irving Association for the Gifted and Talented. (MC)

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Project Eureka: A Program For the Academically Gifted

At a time when educators are being continuously confronted with budgetary cuts and, at the same time, are being held accountable for providing quality education, ingenuity in augmenting traditional curriculum offerings is more salient now than ever before. This is particularly true in the area of gifted education where enrichment programs have long remained the primary responsibility of the regular classroom teacher. Realistically, this charge rarely becomes fulfilled due to the more pressing demands and priorities of focusing instruction on the needs of the class as a whole, with any additional attention usually provided for those who have difficulty in mastering the essentials. In addition, there are the limitations of time and resources. Gifted students, therefore, are too often left to fend for themselves. As a result, student, school and community are caught in a no-win situation. Students are denied the opportunity to actualize their potential and as a result, both school and community fail to reap the rewards of their creative efforts.

To meet the needs of gifted students, the Irving (Texas) Independent School District developed and implemented Project Eureka for their district-wide fifth grade, middle school students. With monies from an ESEA Title IV, Part C grant, district administrators designed a program which clearly defined procedures for identifying gifted and talented students, provided plans for program organization and implemented a sequential program of instructional activities that encompassed an entire academic year. Evaluation consisted of pre- and post-testing on each of the five skill areas. Assessment instruments were developed and validated by the Planning, Evaluation, Research and Development Department of Region 10 Education Service Center in Richardson, Texas.

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Selecting Project Eureka Students

While the literature suggests a variety of ways to identify gifted students, school personnel elected to use a multi-faceted selection process. To begin with, all fifth grade students (approximately 1,750) were tested on the School and College Aptitude Test (SCAT) and the Scientific Research Associates Achievement Test (SRA). Test scores were then combined and placed in rank order. Supplementing the numerical index were samples of students' work, teacher and principal recommendations, student nominations and parent requests. By amassing both objective and subjective data, target populations were identified holistically. A committee comprised of the assistant superintendent for instruction, a teacher certified in gifted and talented, the curriculum director and several middle school principals and teachers, then identified the top 65 students who were classified as being academically gifted. These students were assigned to four groups, each group having approximately 16 students.

Program Organization

With the contemporary trend in declining enrollments, available classroom space and professional staffing were not particular problems. One classroom, in a middle school which was centrally located within the district, was designated for instructing Project Eureka students. Program activities were scheduled to accommodate each of the four groups of students one day a week, Monday through Thursday, with Friday being used as a teacher planning day.

Using Bloom's Taxonomy (cognitive domain) as a guide for program development and emphasizing instruction in critical thinking skills, Project Eureka focused on five areas of skill development: gathering, organizing, interpreting and synthesizing data as well as making predictions or forecasting results which were based on information gained by using activities associated with the four previous skill areas.

Instruction consisted of two parts; one part focused on teaching students the basic skills consistent with each of the five areas, while the second part focused on individual and group projects that addressed each of the five areas. Although classroom instruction was primarily conducted by the project teacher and her aide, teachers, parents, and community volunteers were utilized as guest speakers and resource specialists to supplement instruction. By calling for and using these volunteers in the instructional design of Project Eureka, project personnel fostered a wide commitment to the program itself and were assured of an adequate pool of instructional talent.

Implementing the Program

Keying-off the Taxonomy's cognitive hierarchy (knowledge, comprehension, application, analysis, synthesis and evaluation), an instructional program was adopted to promote skill development in areas such as research methodologies, logical and original thinking, problem solving, and divergent and convergent thinking. Teaching techniques and strategies ranged from using the expository mode to that of including discovery and demonstration in instructional activities. Moreover, the classroom atmosphere was designed to encourage the use of imagination, stimulate curiosity and reward initiative.

Instruction in gathering data focused on the acquisition of basic research skills. Not limited to historical or library type research, instruction in the use of the card catalogue and in other reference materials such as the encyclopedia, World Almanac, Atlas and the like, were provided by both teacher and librarian. Through additional instruction in note taking skills, historical research methods, interviewing techniques, developing good listening habits, the rudiments of survey research, questionnaire construction and data analysis and interpretation, students were provided with a foundation for gathering information and undertaking the demands of the more complex cognitive skills.

Finally, instruction in asking provocative questions (ascertaining fact from conjecture) and the skills of search -- the use of trial and error as well as controlled experimentation -- were also provided to Eureka students.

Resource people who provided instruction in the above areas included a journalist, a marketing analyst, a research scientist, a history teacher and an attorney. Each one provided a specific example of research and the specific skills necessary for gathering his kind of data. Students then selected a topic of interest and exercised their newly acquired skills. Projects included brief histories of famous people, newspaper articles or television newscasting scripts and written projects in special interest areas such as animals, wars and space flight.

Organizing information into a meaningful and coherent structure is a skill that surpasses the mere acquisition of knowledge. Experiences in finding some form or pattern that links data together, instruction in logic (both inductive and deductive reasoning), the preparation of outlines, grouping facts into appropriate categories, sequencing events and labeling and classifying components with similar or common characteristics provided students with experiences necessary for communicating their ideas with order and clarity. Exercises which called for students to summarize main ideas from reading passages, sequence factual events from an historical narrative, arrange and classify symbols and biological elements with one or more likenesses and work with Tangrams and puzzles facilitated the acquisition of organizational skills.

Interpreting the findings of data, once it has been collected and arranged in a coherent fashion, was the next skill area for instruction. Activities emphasizing the importance of interrelationships between objects or ideas, allowing students to draw generalizations, inferring cause and effect relationships, translating ideas into symbols and making assumptions based on fact,

provided students with opportunities to find diverse solutions to problematic situations. Classroom exercises that included brainstorming, using a modified version of the Delphi Technique, studying paradoxes, identifying and examining inherent properties or attributed and analyzing discrepancies in two or more factual accounts of a singular event involved activities that assisted students in strengthening their skills in interpretation. Projects that required students to draw conclusions and make assumptions (such as writing short mystery stories), read and interpret charts and graphs, translate codes, reach consensus in a hypothetical situation and to utilize Word Trees and Palindromes also strengthened skill development.

Synthesizing, the ability to draw conclusions or put fragments or parts together to form a whole, reflects insight and understanding.. Instructional activities which focused on experience in synthesizing included drawing generalizations from multiple sources such as newspapers, television and magazine articles, formulating or stating hypotheses in a scientific experiment, constructing syllogisms, drawing analogies from corresponding circumstances and selecting central themes from reading passages. Research papers comparing ways in which various animals live and solve problems of existence, survival and protection and how mechanical or scientific products have been adapted from some similar features in nature reinforced the concept of synthesizing. In group projects, small groups of students labeled signs with chemical names and symbols. Students then joined together and looked for characteristics that were both alike and different. After arranging these properties in several ways, students identified those that were good and wholesome or dangerous and combustible. Group work also focused on futurism. Using the conceptual diversions of politics, economics and defense, students studied attributes of our contemporary society and developed a community of the future, complete

with laws, methods of earning a livelihood and a protection system for our geographic boundaries.

Making predictions, juding probable outcomes based on amassed information or evidence, is the highest level of skill development. Students were provided with instruction in probability theory, predicting two or more outcomes from situational essays, studying the properties of change through exercises focusing on opportunities for making alterations, modifications and substitutions (studying different ethnic groups and comparing their social system with their own), practice in deciding upon solutions in terms of consequences and implications and exercises which required students to extrapolate from the results of specific ideas of courses of action. Group work included providing students with a series of short reading passages. After reading the passages, students listed the new and different ideas they had gained as a result of the reading. Using this list, students developed a single story based on their list of ideas. Manipulating three-dimensional forms and exposure to open-ended situations (solving a problem or finishing a story based on viewing a filmstrip with deleted frames) were additional activities used to assist students in making predictions based on acquired information.

Conclusion

Project Eureka students, on the basis of pre-and post-test measures analyzed with the t-test for correlated samples showed highly significant gaines in their ability to gather, organize, interpret and synthesis data as well as to predict outcomes based on data analysis. The Irving Association for the Gifted and Talented was organized as a direct result of Project Eureka.

Although originally devised as a curriculum for academically gifted and talented fifth grade students in Irving, Texas, Project Eureka speaks to middle school students of all ages. Furthermore, the curriculum provides a valuabl

guide for exemplary ideas, activities and projects to stimulate learners and initiate productive thinking skills in a regular classroom setting.